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## **Species Composition, Distribution and Abundance of Hydromedusae in the Exclusive Economic Zone of the East Coast of India**

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**Abstract** Based on zooplankton collections made by Fisheries Ocean Research Vessel *Sagar Sampada* Central Marine Fisheries Research Institute, India, during the period 1986-1990, 356 samples from 18 cruises from Sri Lanka to Calcutta coast were analysed. The hydromedusae were encountered in 273 samples and more than 62 species were found. *Liriope tetrphylla* dominated in the percentage of occurrence and population density. *Aglaurea hemistoma*, *Solmundella bitentaculata*, *Rhopalonema velatum*, *Cyrtosira tetrastyla*, *Bougainvillia fulva* and *Phialidium hemisphaericum* were the commonly occurring species. The maximum species diversity was noticed away from the nearshore stations, while maximum population density was from nearshore stations.

**Key words:** hydromedusae, species composition, distribution, abundance, east coast of India

### **Introduction**

Distribution of hydromedusae in the Indian Ocean including the Bay of Bengal was reported by Navas (1971), Vannucci and Navas (1973a, b, c) and Santhakumari (1977a) based on the samples in the International Indian Ocean Expedition (1962-1965). But in this expedition coastal areas were not thoroughly sampled. A comprehensive study from the coast of India, especially in its exclusive economic zone (EEZ), has not been undertaken. The available information on the distribution of hydromedusae is confined to areas off the southwest coast of India (Nair, 1954; Vannucci and Santhakumari, 1969; Santhakumari, 1977a, b, 1991). The only a report about the distribution of hydromedusae from the east coast of India is by Ganapati and Nagabhushanam (1958) who recorded the seasonal distribution of hydromedusae from Visakhapatnam. The present paper deals with the distribution of hydromedusae based on the material collected by FORV *Sagar Sampada* from the EEZ of the east coast of India.

### **Materials and Methods**

Samples were collected in 18 cruises on board FORV *Sagar Sampada* from the EEZ of the east coast of India, from Sri Lanka to Calcutta, during the period 1986-1990. By an oblique haul from 150m depth to surface using Bongo net (mouth diameter 60 cm; mesh aperture 0.33 mm) equipped with a calibrated flow meter, 356 zooplankton samples were taken and preserved in 5% formalin sea water solution, and the hydromedusae were separated and analysed. The sampling details were presented in the cruise reports (Central Marine Fisheries Research Institute, 1986). Hydromedusae counts were transformed to numbers per unit volume using flow meter data.

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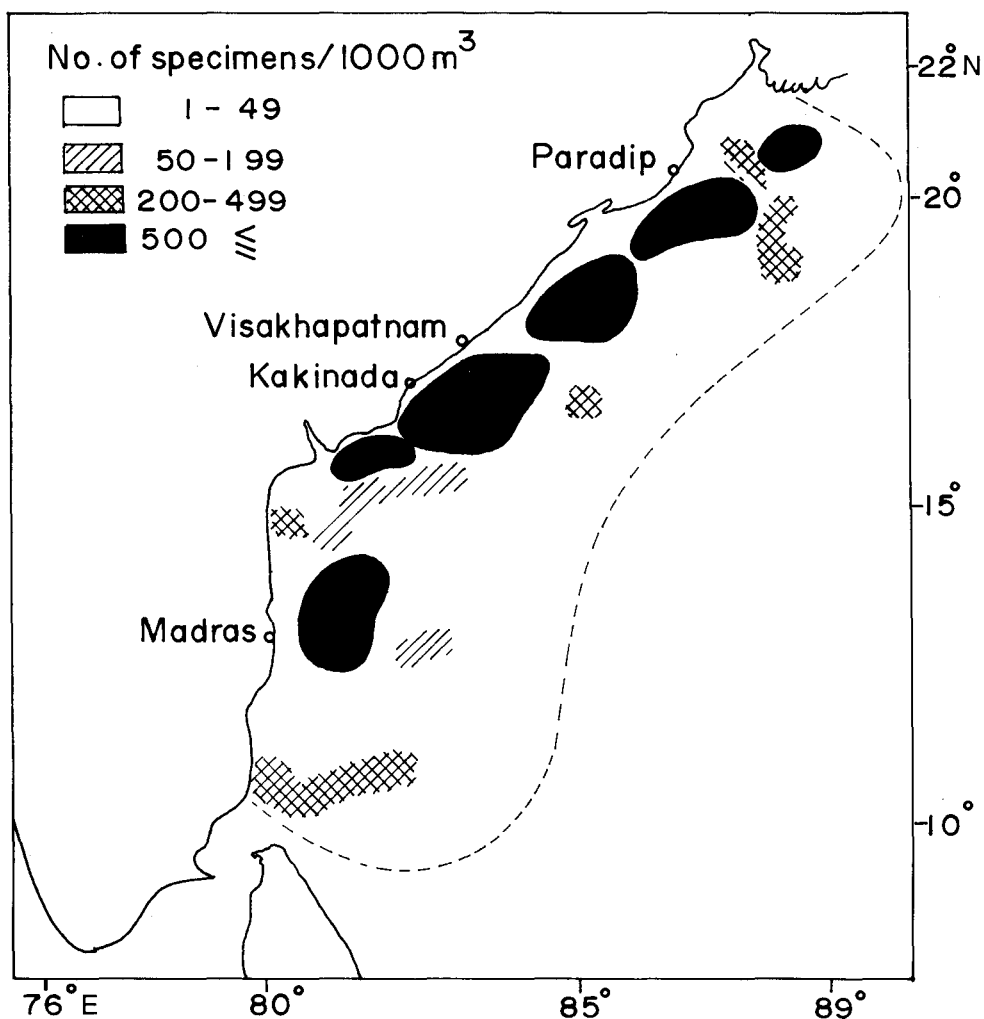


Fig. 1. Abundance of hydromedusae from EEZ of east coast of India during 1986-1990.

### Results and Discussion

#### Species composition

More than 62 species of 37 genera were found as given below according to the order. In this collection no new members of the hydromedusae in the Indian Ocean were recorded.

#### Anthomedusae

- Sarsia mirabilis* Agassiz
- Hybocodon unicus* Browne, *H. forbesi* Mayer
- Ectopleura dumortieri* Van Beneden
- Euphysora bigelowi* Maas, *E. normani* Browne
- Zanclea dubia* Kramp

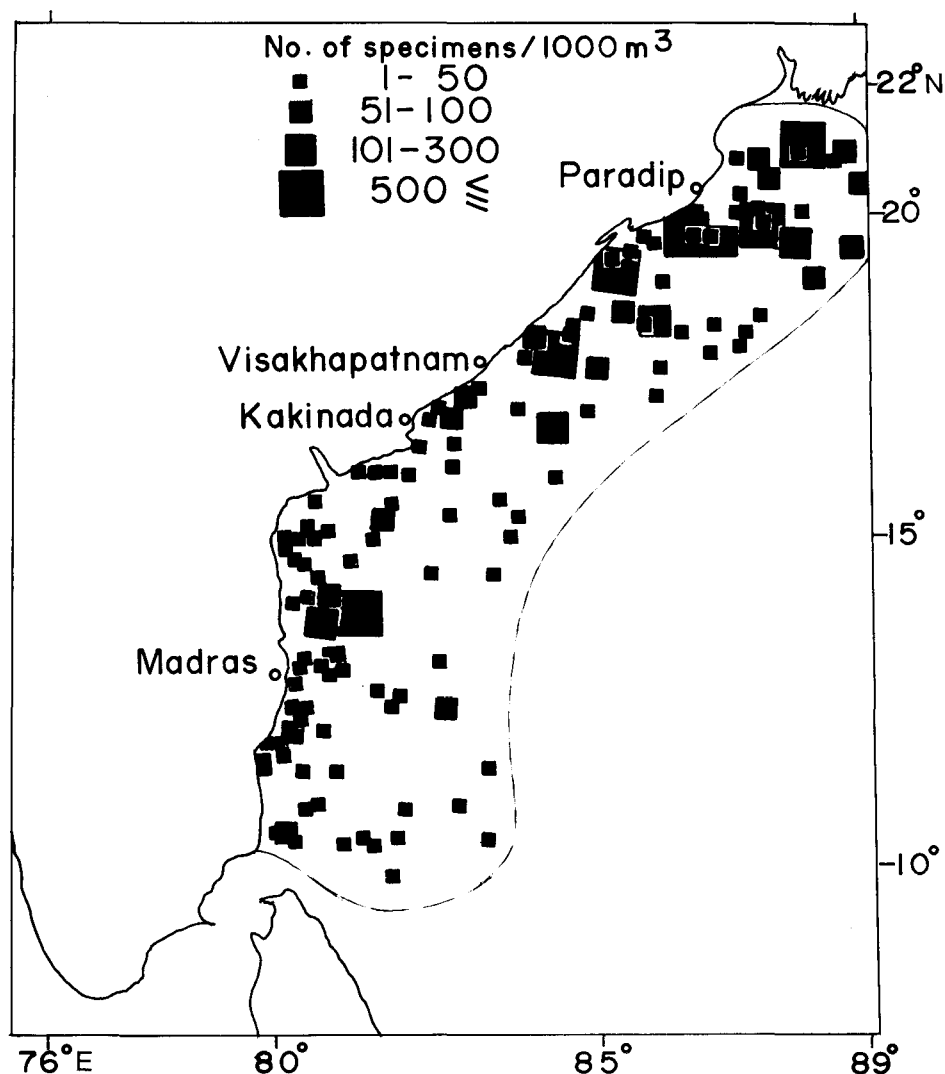


Fig. 2. Distribution and abundance of *Liriope tetraphylla*.

*Cnidocodon leopoldi* Bouillon

*Cytaeis tetrastyla* Eschscholtz, *C. vulgaris* Agassiz and Mayer

*Lizzia gracilis* Mayer

*Podocoryne apicata* Kramp

*Bougainvillia bitentaculata* Uchida, *B. fulva* Agassiz and Mayer, *B. platygaster* Haeckel, *B. ramosa* Van Beneden

*Kollikerina octonemalis* Maas

*Merga tergestina* Neppi and Stiasny

*Amphinema rugosum* Mayer

*Octotiarra russelli* Kramp

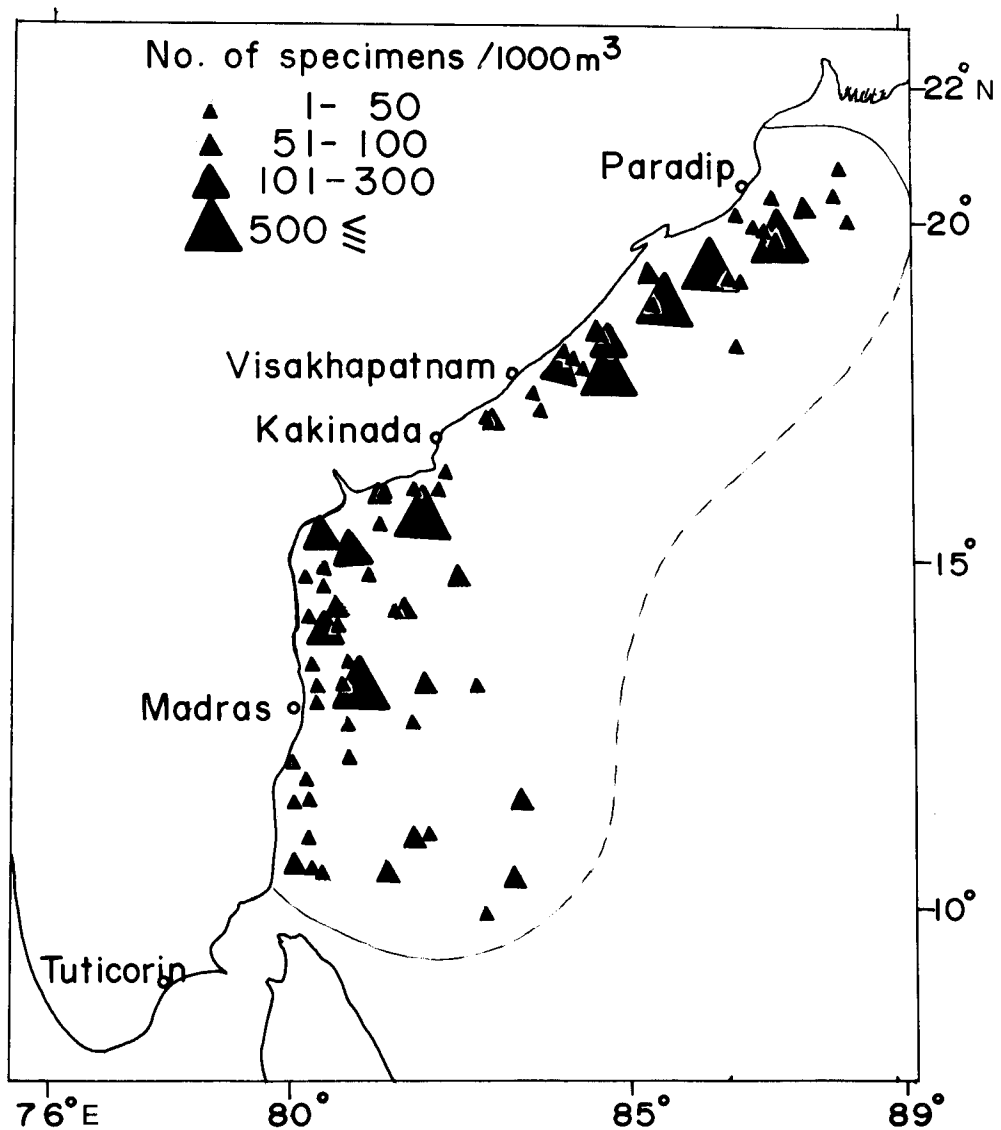


Fig. 3. Distribution and abundance of *Aglaura hemistoma*.

*Leuckartiara octona* Fleming

### Leptomedusae

*Obelia* spp.

*Phialidium hemisphaericum* (L.), *P. simplex* Browne, *P. brunescens* Bigelow, *P. globosum* Mayer

*Eucheilota menoni* Kramp, *E. tropica* Kramp

*Phialucium carolinae* Mayer, *P. multitentaculatum* Menon

*Octophialucium indicum* Kramp, *O. bigelowi* Kramp

*Eirene elliceana* Agassiz and Mayer, *E. ceylonensis* Browne, *E. hexanemalis* Goette

*Helgicirrha malayensis* Stiasny

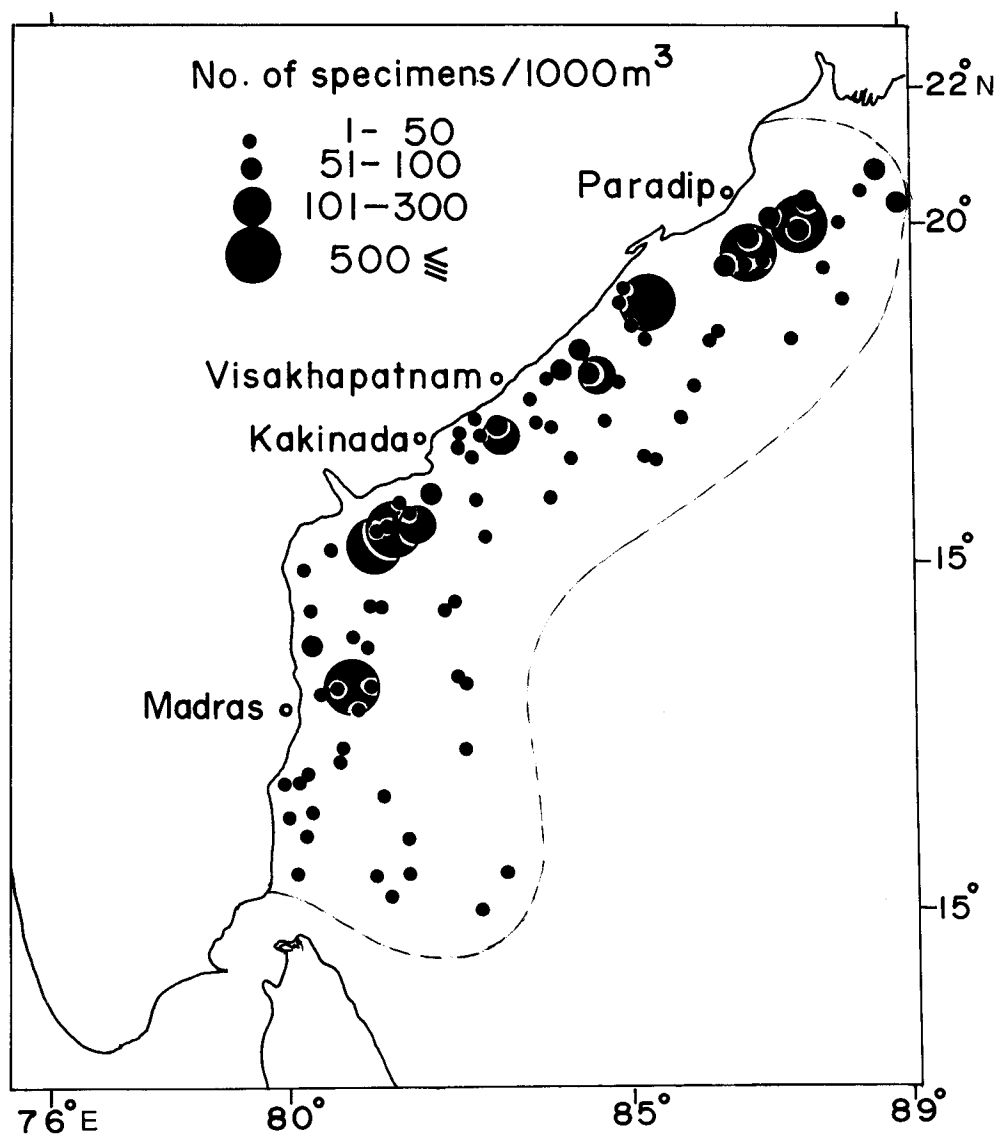


Fig. 4. Distribution and abundance of *Solmundella bitentaculata*.

*Eutima mira* McCrady, *E. curva* Browne

*Aequorea aequorea*, Forskål, *A. conica* Browne, *A. globosa* Eschscholtz, *A. pensilis* Eschscholtz,  
*A. parva* Browne

#### **Limnomedusae**

*Proboscoidactyla ornata* McCrady

#### **Trachymedusae**

*Rhopalonema velatum* Gegenbaur, *R. funerarium* Vanhöffen,  
*Pantachagon scotti* Browne, *P. haeckeli* Maas

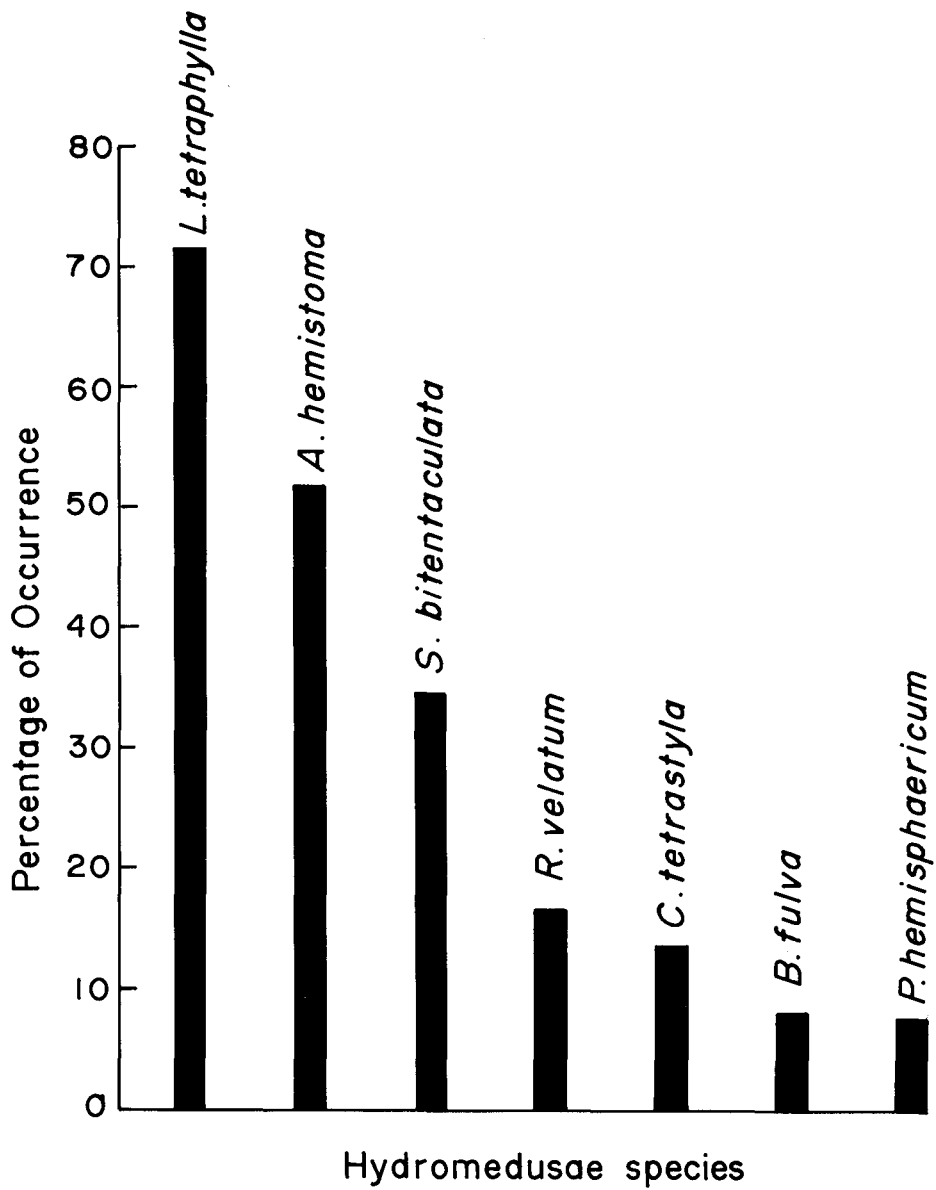


Fig. 5. Percentage of occurrence of common species.

*Amphogona apicata* Kramp

*Crossota alba* Bigelow, *C. brunnea* Vanhöffen

*Aglaura hemistoma* Péron and Lesueur, *A. elata* Haeckel

*Geryonia proboscidalis* Forskål

*Liriope tetraphylla* Chamisso and Eysenhardt

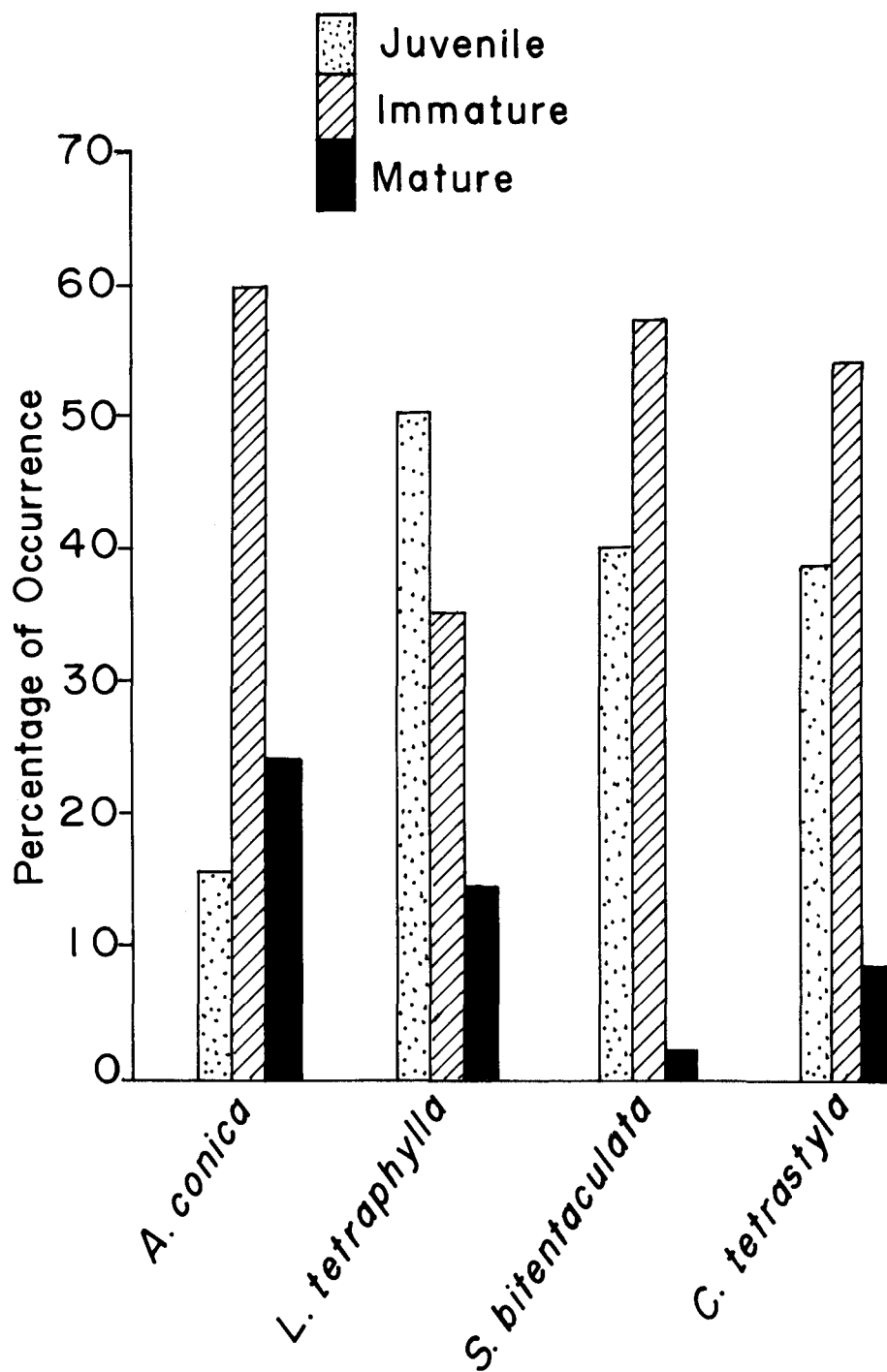


Fig. 6. Percentage composition of the different maturity stages of common species.



### Narcomedusae

*Aegina citrea* Eschscholtz

*Solmundella bitentaculata* Quoy and Gaimard

*Pegantha clara* Bigelow

*Solmaris lenticulata* Haeckel

*Cunina octonaria* McCrady, *C. tenella* Bigelow, *C. duplicata* Maas

### Abundance and distribution

Hydromedusae were obtained from 273 out of the 356 samples (76.7% of the samples). Dense population of hydromedusae, more than 500 inds./1000m<sup>3</sup>, was recorded from off Madras to off Paradip and the highest density, 5941 inds./1000m<sup>3</sup>, was recorded off Paradip. Low population densities were encountered in many stations, covering larger areas (Fig. 1).

*Liriope tetraphylla*, one of the holoplanktonic species, occupied the most dominant position with 71.1% occurrence (Figs. 2, 5) and its maximum population density was 3552 inds./1000m<sup>3</sup> off Paradip. This species has a very wide distribution in the study area. The second dominant species in the percentage of occurrence (51.8%) was *Aglaura hemistoma*, one of the holoplanktonic species (Figs. 3, 5). These two species were often seen in the same collections whereas they excluded each other when one of them occurred in swarms. *A. hemistoma* was reported as the most dominant species of the EEZ of the west coast of India (Santhakumari, 1993), whereas *L. tetraphylla* was the most dominant species in the east coast of India as is recorded in the present study. Vannucci and Navas (1973a) already recorded a similar trend of dominance in the distribution of these two species, *A. hemistoma* in the Bay of Bengal and *L. tetraphylla* in the Arabian Sea, respectively.

*Solmundella bitentaculata* occupied the third position in the percentage of occurrence (34.5%) (Figs. 4, 5) and *Rhopalonema velatum* occupied 4th position in percentage composition. Other commonly occurring species like *Cytaeis tetrastyla*, *Bougainvillia fulva* and *Phialidium hemisphaericum* occurred in low numbers (Fig. 5) and were restricted to near shores.

*Aequorea conica* was also observed frequently in fairly high population density in the coastal areas, but in very low (less than 10%) percentage of occurrence. Santhakumari (1991) had recorded dense swarms (highest record of 181 inds./m<sup>3</sup>) of this species from the southwest coast of India.

*Phialucium indicum*, *P. brunescens*, *Eutima mira*, *Geryonia proboscidalis*, *Aequorea aequorea* and *Euphysora bigelowi* appeared only occasionally from little away from coastal stations.

Deep water species *Crossota alba*, *Aegina citrea*, *Pegantha clara* and *Aglantha elata* were not abundant in population density and not frequently found in the collections. This was due to the shallow collection depth (0-150m).

The remaining species occurred only once or twice in the present samples.

Juveniles and immature stages were dominant in common species, especially in *Solmundella bitentaculata* (Fig. 6).

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